

LISTING OF CLAIMS

1. – 42. Cancelled

43. (Currently amended) The exhaust system according to Claim ~~[[42]]~~62, wherein said rotatable propeller type blade assembly is mounted on a Teflon-filled bronze bearing that is rotatably mounted on a shoulder screw.

44. (Cancelled)

45. (Currently amended) The exhaust system according to Claim ~~[[42]]~~62, wherein said ~~[[expansion tube]]~~ chamber has at least about 85% greater flow cross-sectional area than said inlet tube.

46. (Currently amended) The exhaust system according to Claim ~~[[42]]~~62, wherein said ~~[[expansion tube]]~~ chamber has at between about 75% to about 90% greater flow cross-sectional area than said inlet tube.

47. (Currently amended) The exhaust system according to Claim ~~[[42]]~~62, wherein said rotatable propeller type blade assembly is comprised of multiple blades.

48. (Cancelled)

49. (Currently amended) The exhaust system according to Claim ~~[[42]]~~47, wherein said blades of said rotatable propeller type blade assembly are arranged substantially at about a 30 degree spiral twist relative to the path of said exhaust combustion gases.

50. (Cancelled)

51. (Currently amended) The exhaust system according to Claim ~~[[42]]~~62 wherein said sound suppression materials are selected from the group consisting of fiberglass, glass wool, copper wool, copper strands, steel wool and a combination thereof ~~[[;]]~~ .

52. (Currently amended) The ~~[[exhaust system]]~~ device according to Claim ~~[[42]]~~63, wherein said exhaust chamber system is joined directly to an internal combustion engine.

53. - 54. (Cancelled)

55. (Currently amended) The device recited in Claim ~~[[54]]~~63, wherein said gases freely exit said outlet tube without back pressure on said engine.

56. (Currently amended) The device recited in Claim ~~[[54]]~~63, wherein said blades are set between 20 – 60 degrees relative to the path of said exhaust gases.

57.-58. (Cancelled)

59. (Currently amended) The device recited in Claim ~~[[54]]~~63, wherein said ~~[[expansion tube]]~~ chamber has at between about 75% to about 90% greater flow cross-sectional area than said inlet tube.

60. (Cancelled)

61.(Currently amended) The method according to Claim ~~[[60]]~~66, wherein the rotation of said rotatable propeller forces said exhaust gases into a tightly spun vortex as said exhaust gases ~~[[expand in]]~~ pass through said ~~[[expansion]]~~ chamber inducing a vacuum to draw exhaust gases from said internal combustion engine.

62. (New) A high performance exhaust system for removing combustion gases from an internal combustion engine comprising:

a shell;

a tubular chamber within said shell;

a sleeve in said shell;

sound suppression materials in said sleeve;

said tubular chamber being perforated with apertures to about 40 – 80% porosity;

an inlet tube subassembly fastened to said shell in communication with said tubular chamber;

an outlet in said chamber remote from said inlet tube for permitting combustion gases to exit from said system;

a rotatable propeller type blade assembly arranged in said inlet tube, said rotatable propeller being seated in but not blocking said chamber and capable of rotation when said combustion gases pass from said inlet tube into said tubular chamber,

rotation of said propeller assembly inducing passage of exhaust gases through said expansion chamber to exit through said outlet,

the diameter of said chamber being not more than about 2.2 times the diameter of said inlet tube, so that gases entering said tubular chamber are swirled though said chamber at an accelerating rate to exit through said outlet.

63. (New) A device for increasing the efficiency of an internal combustion engine having an exhaust for gases wherein back pressure of exhaust gases exerted on said engine is reduced, said device comprising:

- an inlet tube for exhaust gases in flow communication with said engine exhaust,
- a chamber for receiving exhaust gases in flow communication with said inlet tube,
- an outlet tube for exiting gases from said expansion chamber, and
- a blade assembly arranged between said inlet tube and said expansion chamber tube,
said blade assembly being adapted to move said exhaust gases into said chamber
without blocking entry into said chamber,

wherein the diameter said chamber is less than about 2.2 times the diameter of said inlet tube and the combined interior diameter dimensions of said inlet tube and said chamber are less than about a third of the length of said chamber, so that gases entering said chamber are swirled through said chamber at an accelerating rate to exit said outlet.

64. (New) The device recited in Claim 63, wherein said blade assembly creates a vortex inducing passage of exhaust gases through said chamber to exit through said outlet.

65. (New) The device recited in Claim 63, wherein said blade assembly is arranged substantially at about a 20 - 60 degree spiral twist relative to the path of said exhaust combustion gases.

66. (New) A method for improving the performance of an internal combustion engine exhaust system comprising:

providing an inlet attached to an engine and a chamber attached to said inlet, said chamber having a diameter of about 2.2 times the diameter of said inlet,

attaching in said inlet a rotatable propeller having a blade assembly arranged angularly disposed toward said chamber within said exhaust system without materially blocking the flow of exhaust gases from said engine;

rotating said propeller when exhaust gases pass from said inlet into said chamber, and

swirling exhaust gases responsive to rotating said propeller through said exhaust system to exit from an outlet in said expansion chamber without materially inducing back pressure on said engine.